

CONTENTS

Part A Constitutive Modeling

Study on Softening Constitutive Model of Soft Rock Using Strain Space Based Unified Strength Theory <i>L. Song, C. Cho, S. Lu and H. Liao</i>	3
Dynamic Crushing Simulation of Metallic Foams with Respect to Deformation and Energy Absorption <i>Y. F. Zhang and L. M. Zhao</i>	9
Comparative Study of Single Crystal Constitutive Equations for Crystal Plasticity Finite Element Analysis <i>M. G. Lee, R. H. Wagoner and S.-J. Kim</i>	16
Plastic Deformation Behavior of High Strength Steel Sheet under Non-Proportional Loading and Its Modeling <i>T. Uemori, Y. Mito, S. Sumikawa, R. Hino, F. Yoshida and T. Naka</i>	22
A Full Constitutive Relation of Silicon-Steel Sheet with Anisotropy Considered <i>S. M. Byon, U. K. Yoo and Y. Lee</i>	28
Some Remarks on Rate-Sensitivity of NiTi Shape Memory Alloys <i>O. Bruhns</i>	34
Creep Analysis for a Wide Stress Range Based on Stress Relaxation Experiments <i>H. Altenbach, K. Naumenko and Y. Gorash</i>	41
Damage-Coupled Constitutive Model for Uniaxial Ratcheting and Fatigue Failure of 304 Stainless Steel <i>G. Kang, J. Ding and Y. Liu</i>	47

An Improved Analytical Constitutive Relation for Normal Weight High-Strength Concrete <i>Z. H. Lu and Y. G. Zhao</i>	53
Thermomechanical Response of the Rotary Forged WHA over a Wide Range of Strain Rates and Temperatures <i>W. G. Guo, C. Qu and F. L. Liu</i>	59
Creep Constitutive Relationships and Cyclic Behaviors of Sn _{96.5} Ag ₃ Cu _{0.5} under High Temperatures <i>J.-H. Liu, X.-Q. Meng and J.-Q. Xu</i>	66
 Part B Damage, Fracture, Fatigue and Failure	
Plastic Deformation of Polymer Interlayers During Post-Breakage Behavior of Laminated Glass — Partim 2: Experimental Validation <i>D. Delincé, D. Callewaert, W. Vanlaere, J. Belis and J. Depaew</i>	75
Study on the Fracture Behavior of W-Ni-Fe Heavy Alloys <i>W. Song, J. Ning and H. Liu</i>	81
Analysis of Collision Between Drillstring and Well Sidewall <i>G. H. Zhao and Z. Liang</i>	87
FE Simulation of Edge Crack Initiation and Propagation of Conventional Grain Orientation Electrical Steel <i>D. H. Na and Y. Lee</i>	93
Prediction of the Delamination in the Pearlitic Steel Filaments by 3 Dimensional Atom Probe Tomography <i>Y. S. Yang, C. G. Park, J. G. Bae and D. Y. Ban</i>	99
Low Cycle Fatigue Behavior of Zn-22Al Alloy in Superplastic Region and Non-Superplastic Region <i>A. Kushibe, T. Tanaka, Y. Takigawa and K. Higashi</i>	105
Temperature Dependent Fracture Model and Its Application to Ultra Heavy Thick Steel Plate Used for Shipbuilding <i>Y. C. Jang, Y. Lee, G. B. An, J. S. Park, J. B. Lee and S. I. Kim</i>	111
Investigation of Fretting Fatigue Behavior of Ti811 Alloy at Elevated Temperature <i>X.-H. Zhang and D.-X. Liu</i>	117

Effect of Various Heat Treatment Processes on Fatigue Behavior of Tool Steel for Cold Forging Die <i>S. U. Jin, S. S. Kim, Y. S. Lee, Y. N. Kwon and J. H. Lee</i>	123
Fatigue Life Prediction of Rolled AZ31 Magnesium Alloy Using an Energy-Based Model <i>S. H. Park, S.-G. Hong, B. H. Lee and C. S. Lee</i>	131
Plastic Deformation of Polymer Interlayers During Post-Breakage Behavior of Laminated Glass — Partim 1: Analytical Approach <i>J. Belis, D. Delince, D. Callewaert, R. van Impe and J. Depauw</i>	137
Load Carrying Capacity of Corroded Reinforced Concrete Beams Subjected to Repeated Load <i>C. Fang, M. Yi and S. Cheng</i>	143
A Model for Galling Behavior in Forming of High Strength Steel under Tension-Bending <i>Y. K. Hou, W. G. Zhang, Z. Q. Yu and S. H. Li</i>	149
Dynamic Failure of a Spot Weld in Lap-Shear Tests under Combined Loading Conditions <i>J. H. Song, J. W. Ha, H. Huh, J. H. Lim and S. H. Park</i>	155
Evaluation of Damage in Steels Subjected to Exploitation Loading — Destructive and Non-Destructive Methods <i>Z. L. Kowalewski, S. Mackiewicz, J. Szelażek, K. Pietrzak and B. Augustyniak</i>	161
Fatigue Properties of Automobile High-Strength Bolts <i>C. Zhou, S.-I. Nishida and N. Hattori</i>	167
Research on the Effect of Loading Conditions on the Strength and Deformation Behaviors of Rocks <i>P.-Z. Pan, X.-T. Feng and H. Zhou</i>	173
Part C Dynamic Loading and Crash Dynamics	
Numerical Simulation of Dynamic Failure for Alumina Ceramic <i>H. Ren and J. Ning</i>	181
Analysis of Dynamic Stress-Strain Relationship of Loess <i>H. Liao, Z. Zhang, C. Ning, J. Liu and L. Song</i>	187

Study of Cutting Aerial PMMA with Miniature Detonation Cord <i>Z. Q. Li, L. M. Zhao and Y. G. Zhao</i>	194
A Study on the Behavior of a Thin STS 304 Sheet with a Free Boundary Conditions Subjected to Impact Loading <i>D. G. Ahn, G. J. Moon, C. G. Jung and D. Y. Yang</i>	200
Design of the Cross Section Shape of an Aluminum Crash Box for Crashworthiness Enhancement of a Car <i>S. B. Kim, H. Huh, G. H. Lee, J. S. Yoo and M. Y. Lee</i>	206
Regression Model for Light Weight and Crashworthiness Enhancement Design of Automotive Parts in Frontal Car Crash <i>G. Bae, H. Huh and S. Park</i>	212
An Experimental Study on the Impact Deformation and the Strain Rate Sensitivity in Some Structural Adhesives <i>T. Nagai, T. Iwamoto, T. Sawa, Y. Sekiguchi, H. Kuramoto and N. Uesugi</i>	218
Effects of Impact Velocity and Slenderness Ratio on Dynamic Buckling Load for Long Columns <i>K. Mimura, T. Umeda, M. Yu, Y. Uchida and H. Yaka</i>	224
Crashworthiness Design of the Shear Bolts for Light Collision Safety Devices <i>J. S. Kim, H. Huh and T. S. Kwon</i>	231
Computational Performance Evaluation of a Side Structure Considering Stamping Effects <i>S.-H. Kim and K.-P. Kim</i>	237
A New Method for Vibration Response of Beam on Foundation under Moving Load <i>Y. Yang and X. Ge</i>	243
 Part D Engineering Applications and Case Studies	
Trimming Line Design Using an Incremental Development Method and a Finite Element Inverse Method <i>Y.-J. Song, C.-D. Park, Y.-H. Hahn and W.-J. Chung</i>	251

Effects of Heat Treatments on the On-Line Service Life of a Press Die Manufactured by W-EDM <i>K.-K. Choi and Y.-S. Lee</i>	259
Calculation of the Ultimate Bearing Capacity of Soil Slope Based on the Unified Strength Theory <i>H. Liao, Z. Ma and L. Su</i>	265
Top Joint Study on Temperature Stress for Super-Long Slab-Column Structure <i>M. Gong, L. Song and Y. Shao</i>	271
A Process Map for Sequential Compression-Backward Extrusion of AZ31 Mg Alloys at Warm Temperatures <i>D.-J. Yoon, E.-Z. Kim, C.-D. Cho and Y.-S. Lee</i>	277
A Numerical Simulation of Strip Profile in a 6-High Cold Rolling Mill <i>X. Du, Q. Yang, C. Lu, A. K. Tieu and S. Kim</i>	283
Dynamic Simulation of the Tailing Process in Hot Finishing Mill <i>S. Kim, C. Lu, X. Du and A. K. Tieu</i>	289
Factor Study for the Separator Plate of MCFC Having Uniform Stiffness at Elevated Temperature <i>S.-W. Lee, J.-H. Kim and J.-H. Jun</i>	295
A Study on the Improvement of the Accuracy of a Shaving Process Using a Progressive Die <i>W.-J. Chung, K.-B. Hwang, J.-H. Kim and H.-Y. Ryu</i>	301
Application of Forming Limit Criteria Based on Plastic Instability Condition to Metal Forming Processes <i>S.-C. Heo, T.-W. Ku, J. Kim, B.-S. Kang and W.-J. Song</i>	308
Tool Path Design of Incremental Open-Die Disk Forging Using Physical Modeling <i>S.-U. Lee and D.-Y. Yang</i>	314
Numerical Optimization of Sheet Metal Forming Process Using New Fracture Criterion <i>A. Hirahara, R. Hino, F. Yoshida and V. V. Toropov</i>	320

Study for Blade Ceramic Coating Delamination Detection for Gas Turbine <i>C.-J. Choi, S. H. Choi and J.-Y. Kim</i>	327
Study on Correlation Between Shear Wave Velocity and Ground Properties for Ground Liquefaction Investigation of Silts <i>A. Che, X. Luo, J. Qi and D. Wang</i>	333
A Study on the Stability of Earth Dam Subjected to the Seismic Load <i>J. Q. A. Che and X. Ge</i>	339
A Study of the Reconstruction of Accidents and Crime Scenes Through Computational Experiments <i>S. J. Park, S. W. Chae, S. H. Kim, K. M. Yang and H. S. Chung</i>	345
Prediction of Rolling Force Using an Adaptive Neural Network Model During Cold Rolling of Thin Strip <i>H. B. Xie, Z. Y. Jiang, A. K. Tieu, X. H. Liu and G. D. Wang</i>	351
An Influence Function Method Analysis of Cold Strip Rolling <i>Z. Y. Jiang, D. W. Wei and A. K. Tieu</i>	356
Effect of Asymmetrical Stand Stiffness on Hot Rolled Strip Shape <i>D. Gong, J. Xu, Z. Jiang, X. Zhang, X. Liu and G. Wang</i>	362
Rigid-Plastic Seismic Design of Reinforced Concrete Shear Wall <i>C. L. Fan and S. Y. Zhang</i>	368
 Part E Experimental and Numerical Techniques	
Numerical Study on the Shaped Charges <i>T. B. Ma, C. Wang and J. G. Ning</i>	377
Experimental Study on Mechanical Property of Steel Reinforced Concrete L-Shaped Short Columns <i>Z. Li, H. Qin, H. Dang, H. Li and J.-S. Zhang</i>	383
Microstructure and Crystallographic Texture of Strip-Cast Fe-3.2%Si Steel Sheet <i>Y. B. Xu, Y. M. Yu, G. M. Cao, C. S Li and G. D. Wang</i>	390
Finite Element Simulation of Pore Closing During Cylinder Upsetting <i>M. C. Lee, S. M. Jang, J. H. Cho and M. S. Joun</i>	396

Tensile Test Based Material Identification Program AFDEX/MAT and Its Application to Two New Pre-Heat Treated Steels and a Conventional Cr-Mo Steel	
<i>M.-S. Joun, J.-G. Eom, M.-C. Lee, J.-H. Park and D.-J. Yoon</i>	402
An Elasto-Plastic Analysis of Solids by the Local Meshless Method Based on MLS	
<i>Y. T. Gu</i>	408
Prediction of Plug Tip Position in Rotary Tube Piercing Mill Using Simulation and Experiment	
<i>H. W. Lee, G. A. Lee, E. Z. Kim and S. Choi</i>	415
Study of Accurate High-Speed Tension Testing Method	
<i>T. Umeda and K. Mimura</i>	421
Dynamic Material Properties of the Heat-Affected Zone (HAZ) in Resistance Spot Welding	
<i>J.-W. Ha, J.-H. Song, H. Huh, J.-H. Lim and S.-H. Park</i>	428
An Influence of Selected Mechanical Parameters of MMC on the Thermal Shock Resistance	
<i>D. Rudnik, Z. Kowalewski, K. Pietrzak and A. Wojciechowski</i>	435
Numerical Simulations of the Influence of Striker Bar Length on SHPB Measurements	
<i>D. W. Shu, C. Q. Luo and G. X. Lu</i>	441
Quantitative Relationships Between Microstructural and Mechanical Parameters of Steels with Different Carbon Content	
<i>K. Pietrzak, A. Klasik, Z. Kowalewski and D. Rudnik</i>	447
Experiment Study on Dynamic Strength of Loess under Repeated Load	
<i>Z. H. Xiao, B. Han, H. J. Liao and A. Tuohuti</i>	453
Shear Strength Prediction of RC Beams Wrapped with FRP	
<i>S. Y. Wang, Y. W. Zhou and H. N. Li</i>	459
Study on Stress-Strain Relationshipship of Loess Based on Twin Shear Unified Damage Constitutive Model	
<i>B. Han, H. Z. Li, H.-J. Liao and Z. H. Xiao</i>	466

The Influence of Strain Path on Biaxial Compressive Behavior of AZ31 Magnesium Alloy <i>I. Shimizu, N. Tada and K. Nakayama</i>	472
3D Finite Element Modelling of Complex Strip Rolling <i>Z. Y. Jiang</i>	478
Part F Molecular Dynamics	
The Study on the Gas Permeabilities of the Ethylene/1-Hexene Copolymer by Molecular Dynamics Simulation <i>S. Z. Wu, J. Yi, L. S. Zhang and J. E. Mark</i>	487
Dynamics Behavior Analysis of Globular Particle in Rheology Material with Controlled Solid Fraction <i>K.-Y. Kwon, C.-G. Kang and S.-M. Lee</i>	493
Effect of Helicity on the Buckling Behavior of Single-Wall Carbon Nanotubes <i>J. Huh and H. Huh</i>	500
Part G Nano, Meso, Micro and Crystal Plasticity	
Energy of Armchair Nanotube Using the Modified Cauchy-Born Rule <i>S. Lu, C. D. Cho and L. Song</i>	509
Fabrication of Polymer Master for Antireflective Surface Using Hot Embossing and AAO Process <i>H. G. Shin, J. T. Kwon, Y. H. Seo and B. H. Kim</i>	515
Texture and Formability Development of Asymmetry Rolled AA 3003 Al Alloy Sheet <i>I. Kim, S. Akramov and H. B. Jeong</i>	523
Numerical Simulation of Deep Drawing Process of Aluminum Alloy Sheet Using Crystal Plasticity <i>J. G. Shim and Y. T. Keum</i>	529
An Integrated Micromechanics Modelling Approach for Micro-Forming Simulation <i>W. Zhuang and J. Lin</i>	535

Stretching-Induced Orientation to Improve Mechanical Properties of Electrospun PAN Nanocomposites <i>X. X. Hou, X. P. Yang, F. Zhang, S. Z. Wu and E. Waclawik</i>	541
The Bendability and Formability of Cold Rolled and Heat Treated AZ31 Mg Alloy Sheets <i>I. Kim and S. Akramov</i>	547
The Development of the Microstructure and Texture in Cold Rolled AZ31 Mg Alloy Sheets <i>I. Kim and S. Akramov</i>	553
Texture Development and Drawability of Frictionally Rolled AA 5052 Al Alloy Sheet <i>I. Kim, S. Akramov, H. B. Jeong and T. K. No</i>	559
Grain-Size Dependent Yield Behavior under Loading, Unloading and Reverse Loading <i>N. Ohno, D. Okumura and T. Shibata</i>	565
Finite Element Modelling of Micro-Cutting Processes from Crystal Plasticity <i>Y. P. Chen, W. B. Lee, S. To and H. Wang</i>	571
Finite Element Analysis of Thermal Nanoindentation Process and Its Experimental Verification <i>H.-J. Oh, E.-K. Lee, C.-G. Kang and S.-M. Lee</i>	577
Part H Phase Transformations	
Effect of Transformation Volume Strain on the Spherical Indentation of Shape Memory Alloys <i>W. Yan, Q. Sun and H.-Y. Liu</i>	585
Characterization of Bainitic Microstructures in Low Carbon HSLA Steels <i>J. S. Kang and C. G. Park</i>	593
EBSD Study on the Evolution of Microstructures During Compressive Deformation of an Austenitic Stainless Steel <i>J. B. Jeon and Y. W. Chang</i>	599
Textures of Equal Channel Angular Pressed 1050 Aluminum Alloy Strips <i>J. Y. Park, S.-H. Hong and D. N. Lee</i>	605

- A Study on Impact Deformation and Transformation Behavior of Trip Steel by Finite Element Simulation and Experiment
T. Iwamoto, T. Sawa and M. Cherkaoui 613

Part I Plastic Instability and Strain Localization

- Energy Absorption of Expansion Tube Considering Local Buckling Characteristics
K.-H. Ahn, J.-S. Kim and H. Huh 621

Part J Plasticity in Advanced Materials

- Change in Microscopic Hardness During Tensile Plastic Deformation of Polycrystalline Aluminum and Titanium
X. Wang and T. Abe 631

- FLD of AZ31 Sheet under Warm Stretching and Its Prediction
T. Naka, Y. Nakayama, T. Eumori, R. Hino, F. Yoshida, M. Kohzu and K. Higashi 638

- Effect of High Temperature Deformation on the Low Thermal Expansion Behavior of Fe-29%Ni-17%Co Alloy
K. A. Lee, J. Namkung and M. C. Kim 644

- The Plasticity of Monocrystalline Silicon under Nanoindentation
L. Chang and L. C. Zhang 650

- Characterization of Electro-Rheological Fluid under High Shear Rate in Parallel Ducts
X. W. Zhang, C. B. Zhang, T. X. Yu and W. J. Wen 657

Part K Plasticity in Materials Processing Technology

- Prediction of the Residual Stress in the Process of Straightening Wire
T. W. Kim, M. G. Lee, H.-I. Moon, H. J. Kim and H. Y. Kim 667

- Forming Limit of AZ31B Magnesium Alloy Sheet in the Deep Drawing with Cross Shaped Die
H. Y. Kim, S. C. Hoi, H. J. Kim, S. M. Hong Y. S. Shin and G. H. Lee 673

Micro Forming of Glass microlens Array Using an Imprinted and Sintered Tungsten Carbide Micro <i>J. W. Han, B.-K. Min and S. Kang</i>	679
Fast Springback Simulation of Bending Forming Based on One-Step Inverse Analysis <i>Y.-D. Bao, W.-L. Chen and H. Wu</i>	685
Effect of Initial Microstructure on Hot Forging of Mg Alloys <i>Y. Kwon, Y. Lee, S. Kim and J. Lee</i>	692
The Unloading Modulus of AKDQ Steel after Uniaxial and Near Plane-Strain Plastic Deformation <i>E. J. Pavlina, B. S. Levy, C. J. van Tyne, S. O. Kwon and Y. H. Moon</i>	698
Spring-Back Characteristics of Grain-Refined Magnesium Alloy ZK60 Sheet <i>S.-H. Kang, Y.-S. Lee and J.-H. Lee</i>	704
Incremental Sheet Forming with Local Heating for Lightweight Hard-to-Form Material <i>R. Hino, F. Yoshida, N. Nagaishi and T. Naka</i>	710
Influence of Billet Size on the Deformation Inhomogeneity of Material Processed by Equal Channel Angular Pressing <i>T. Suo, Y. Li and F. Zhao</i>	716
Influence of Shot Peening on Surface Characteristics of High-Speed Steels <i>Y. Harada and K. Fukaura</i>	722
Cold Butt Joining of Light Metal Sheet by Shot Peening <i>Y. Harada and Y. Kobayashi</i>	728
Evolution of Strain States and Textures in AA5052 Sheet During Cross-Roll Rolling <i>S. H. Kim, D. G. Kim, H. G. Kang, M. Y. Huh, J. S. Lee and O. Engler</i>	734
Minimum Wall Thickness of Hollow Threaded Parts in Three-Die Cold Thread Rolling <i>H. P. Qi, Y. T. Li, J. H. Fu and Z. Q. Liu</i>	740

Replication of Nano/Micro Quartz Mold by Hot-Embossing and Its Application to Borosilicate Glass Embossing
S.-W. Youn, C. Okuyama, M. Takahashi and R. Maeda 746

Part L Plasticity in Tribology

Comparing Sliding-Wear Characteristics of the Electro-Pressure Sintered and Wrought Cobalt
J. E. Lee, Y.-S. Kim and T.-W. Kim 755

Part M Porous, Cellular and Composite Materials

A Phenomenological Constitutive Model of Aluminum Alloy Foams at Various Strain Rates
C. Li, Z. H. Wang, L. M. Zhao and G. T. Yang 763

Experimental Investigation on Fracture Toughness of Interface Crack for Rock/Concrete
S. C. Yang, L. Song, Z. Li and S. M. Huang 769

Investigation on the Equivalent Material Property of Carbon Reinforced Aluminum Laminates
S.-H. Song, T.-W. Ku, J. Kim, B.-S. Kong and W.-J. Song 777

Mechanical Properties of Titanium Foam for Biomedical Applications
S. Kashef, J. G. Lin, P. D. Hodgson and W. Y. Yan 783

Homogenized Creep Behavior of CFRP Laminates at High Temperature
Y. Fukuta, T. Matsuda and M. Kawai 789

Investigation on Thermal Properties of Al/SiCp Metal Matrix Composite Based on FEM Analysis
E. Yu, J.-Y. Sun, H.-S. Chung and K. H. Oh 795

Multi-Scale Creep Analysis of Plain-Woven Laminates Using Time-Dependent Homogenization Theory: Effects of Laminate Configuration
K. Nakata, T. Matsuda and M. Kawai 801

Bending Behavior of Simply Supported Metallic Sandwich Plates with Dimpled Cores
D.-Y. Seong, C. G. Jung, D.-Y. Yang and D. G. Ahn 807

Penetration Analysis of Aluminum Alloy Foam <i>N. M. Zhang and G. T. Yang</i>	813
Two-Scale Analysis of Honeycombs Indented by Flat Punch <i>T. Asada, Y. Tanaka and N. Ohno</i>	819
Part N Structural Plasticity	
Tube Hydroforming Process Design of Torsion Beam Type Rear Suspension Considering Durability <i>K.-T. Lee, H.-J. Back, H.-T. Lim, I.-S. Oh and H.-Y. Kim</i>	827
The Deformation of the Multi-Layered Panel of Sheet Metals under Elevated Temperatures <i>S.-W. Lee and D.-U. Woo</i>	834
Numerical Analysis on Magneto-Elasto-Plastic Buckling and Bending of Ferromagnetic Rectangular Plate <i>Y. W. Gao and H. Huh</i>	840
Load-Carrying Capacities for Circular Metal Foam Core Sandwich Panels at Large Deflection <i>W. Hou, Z. Wang, L. Zhao, G. Lu and D. Shu</i>	846
Early Yielding of Liquid-Filled Conical Shells <i>W. Vanlaere, G. Lagae, R. Van Impe, J. Belis and D. Delince</i>	852
Part O Superplasticity	
Experimental Study on Deformation Mechanism of AZ31 Magnesium Alloy under Various Temperature Conditions <i>T. Inaba, T. Yoshikawa and M. Tokuda</i>	861
Part P Time-Dependent Deformation	
Thermal Viscoelastic Analysis of Plastic Components Considering Residual Stress <i>C. W. Choi, K. S. Jeoung, H.-I. Moon and H. Y. Kim</i>	869
Prediction of a Modified PTW Model for Various Taylor Impact Tests of Tantalum <i>J.-B. Kim and H. Shin</i>	875

Effects of Temperature and Forming Speed on Plastic Bending of Adhesively Bonded Sheet Metals <i>M. Takiguchi, T. Yoshida and F. Yoshida</i>	881
Analysis of Elasto-Plastic Stress Waves by a Time-Discontinuous Variational Integrator of Hamiltonian <i>S.-S. Cho, H. Huh and K.-C. Park</i>	887
Visco-Elastic and Plastic Singular Behaviors of an Interface Corner in Electronic Packages <i>J.-Q. Xu, H. M. Zheng and H. L. Zhu</i>	893